

## ACHIEVEMENT AWARD

## Frances H. Arnold, Ph.D.

CALIFORNIA INSTITUTE OF TECHNOLOGY

For discovering and applying directed evolution; creating a paradigm shift in bioengineering; and for an inspiring career of accomplishments in research, mentoring, and tech transfer.



Frances H. Arnold, Ph.D., is the Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering, and Biochemistry at the California Institute of Technology. She pioneered enzyme evolution methods or “directed evolution,” a foundational technology that now permeates many applications of biotechnology in academic and industrial laboratories to optimize enzymes, antibodies and other proteins, metabolic pathways, and whole organisms. Dr. Arnold has demonstrated that biological systems are unique substrates for engineering and design; as the products of evolution’s optimization, they are also uniquely suited to redesign by a similar algorithm.

Along with Willem Stemmer, Ph.D. (who died in 2013), Dr. Arnold was awarded the 2011 Charles Stark Draper Prize from the National Academy of Engineering for her work in engineering novel enzymes and biocatalytic processes for pharmaceutical and chemical products. She and Dr. Stemmer are credited with being the architects of the field of directed protein evolution.

This breakthrough technology has become the method of choice for improving industrial enzymes and creating new ones. Dr. Arnold’s work also inspired invention and development of new evolution-based approaches to biomolecular engineering. Her own recent research focuses on creating new enzymes to enlarge the catalytic repertoire of the biological world and expand the molecules and materials that can be produced using synthetic biology.

The applications of directed evolution are as broad as biotechnology itself — medicine, chemicals, consumer products, environmental biotechnology, and biofuels, to mention a few. Applications of directed evolution are growing, due in part to Dr. Arnold’s efforts to rapidly disseminate their methods and demonstrate them on increasingly complex problems. These methods are now

used by hundreds of researchers worldwide, all testing new applications of evolutionary design.

Dr. Arnold’s work with directed protein evolution has been recognized through numerous awards, including the 2017 Raymond and Beverly Sackler Prize in Convergence Research, the 2016 Millennium Technology Prize, and the Eni Award in Renewable and Non-Conventional Energy in 2013. She received the National Medal of Technology and Innovation in 2013 and was inducted into the National Inventors Hall of Fame in 2014. Dr. Arnold has been elected to membership in all three U.S. National Academies — Sciences, Medicine, and Engineering — the first woman to be so recognized.

She is the director of Caltech’s Donna and Benjamin M. Rosen Bioengineering Center and of the NIH Biotechnology Leadership Pre-doctoral Training Program at Caltech. Active in technology transfer, with a strong interest in sustainability and alternative energy, Dr. Arnold co-founded Gevo Inc. in 2005 to make fuels and chemicals from renewable resources, and Provi Inc. in 2013 to develop nontoxic modes of agricultural pest control. Dr. Arnold holds 57 U.S. patents and is currently an advisor to genomics start-ups Arivale and Twist Bioscience. She is a member of the board of directors of Illumina Inc.

She has trained and mentored many women engineers and scientists who have gone on to leadership positions.

Dr. Arnold earned her B.S. in mechanical and aerospace engineering from Princeton University and her Ph.D. in chemical engineering from the University of California, Berkeley. She loves adventure travel and spent a sabbatical year exploring Africa, Australia, and the U.K. with her husband and three young sons. She often hikes in the mountains near Los Angeles.



## SUZANNE JENNICHES UPWARD MOBILITY AWARD

ENDOWED BY NORTHRUP GRUMMAN CORPORATION

# Denise C. Johnson

CATERPILLAR INC.

For stellar career achievements spurred by deep curiosity and talent; for compelling leadership at work and in the community; and for serving as a true champion of engineers and ideas.

Denise C. Johnson is a group president of Caterpillar Inc. in Deerfield, Illinois, responsible for the resources industries portfolio that supports customers using machinery in mining, construction, and quarry and aggregates applications, including many of Caterpillar's most iconic products. Her role includes management of the enterprise global mining business, the enterprise technology strategy, enterprise procurement, and the enterprise component design and manufacturing. Johnson's team comprises 20,000-plus employees across four divisions, including Innovation and Technology Development, Global Supply Network, Surface Mining and Technology, and Material Handling and Underground.

After building deep expertise in operations and product management at General Motors, Johnson joined Caterpillar in 2011 as general manager of specialty products, where she had global responsibility for wear component products and facilities. A rapid series of promotions followed. In 2012, Johnson was named vice president of the Diversified Products Division; in 2013, vice president of Integrated Manufacturing Operations; and in 2014, vice president of the Material Handling and Underground Division, before being promoted to her current position in 2016.

Throughout her career, Johnson has displayed clarity of direction and the ability to communicate strategy that influences entire organizations. She is thoroughly engaged in the development of the future pipeline of leaders, including as executive sponsor of Caterpillar's Women in Leadership initiative.

Johnson is actively committed to a number of community-based organizations that are designed to

drive progress in key areas of the community culture. As a past board member for The Center for Prevention of Abuse, she has championed the building of safe and peaceful communities. She served on the board of the largest hospital system in downstate Illinois, OSF Healthcare, and she currently serves on the board of The Mosaic Company, which brings together agriculture and mining to keep pace with the world's growing food supply needs. Her active engagement with Mosaic aligns well to her background and current executive leadership position with Caterpillar — promoting progress and exploring possibility.

She is a member of the National Mining Association board of directors and served as the 2016 chair of MINExpo. Johnson also serves on the boards for the National Association of Manufacturers and Junior Achievement USA and is a member of the MIT Leaders for Global Operations governing board. She also is part of the President's Advisory Council on Doing Business in Africa (PAC-DBIA.)

A native of Portland, Michigan, Johnson graduated from Michigan State University in 1989 with a B.S. in mechanical engineering. She earned dual master's degrees in mechanical engineering and business administration from the Massachusetts Institute of Technology (MIT) in 1997 as a Fellow of the MIT Leaders for Global Operations program.

Outside of work you can find Johnson enjoying activities such as swimming and yoga, and she is an avid runner, competing in local races, many of which serve as fundraisers for local nonprofits. She is also a proud grandmother of five, with one more on the way.

## RODNEY D. CHIPP MEMORIAL AWARD

## Mark W. Albers

EXXONMOBIL



For mentoring women engineers; for advancing new internal groups to represent women's interests; and for developing effective programs that advance women engineers while positively transforming the corporate culture.

Mark W. Albers, senior vice president for ExxonMobil, sits on the management committee for the world's largest publicly traded international oil and gas company. In that role, he has spent the past decade promoting leadership opportunities for women throughout all ExxonMobil employee development channels. Albers' detailed, comprehensive, and sound approach to diversity and inclusion (D&I) initiatives involves ongoing stewardship and individual accountability. In addition, focusing on early identification and development of potential female management candidates has profoundly altered ExxonMobil's corporate culture, while producing major gains for women.

Today, women make up more than 30 percent of ExxonMobil's worldwide management and professional population. In 2016, 43 percent of the company's U.S. engineering hires were women — a rate far above the percentage of women enrolled in engineering programs. Women represent more than 30 percent of the 4,000 ExxonMobil employees currently receiving leadership development training, and worldwide, they account for nearly one-third of all career-stage executive employees. Women also now fill 18 percent of all ExxonMobil executive positions, a 50 percent increase during Albers' tenure. This elite group averages 26 years of experience and represents the top 2.4 percent of all ExxonMobil employees.

Albers has personally coached and mentored countless women engineers and professionally supported D&I and work/life balance issues throughout his 38-year ExxonMobil career. In 2003, while a regional vice presi-

dent, he saw how pressure to adapt to the industry's persistently male-dominated culture was forcing many qualified women engineers out, and he helped advance new groups that could amplify women's voices and advance their interests. He helped 20 women executives form the Upstream Women's Leadership Team (WLT) with a goal of identifying and addressing major challenges impeding the company's ability to recruit, retain, and advance women professionals. The WLT formed women's interest networks (WINs) in each of ExxonMobil's five primary Upstream companies based in the United States, and today 70 such groups operate within ExxonMobil businesses worldwide.

Albers joined ExxonMobil in 1979, performing fieldwork in Texas and New Jersey. Since then, he has steadily advanced through a series of technical, managerial, and leadership posts. He served briefly as executive assistant to the chairman before being named president of ExxonMobil Development Company, in 2004, and senior vice president, in 2007.

He is a member of the Society of Petroleum Engineers; the Institution of Engineers, Australia; and the board of trustees of the United States Council for International Business. He serves on the executive committee of the MD Anderson Cancer Center board of visitors and on the Society of Petroleum Engineers industry advisory council.

Albers holds a B.S. in petroleum engineering from Texas A&M University and is married to his high school sweetheart, Cindy. Together, they have four adult children and six grandchildren.




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## RODNEY D. CHIPP MEMORIAL AWARD

# Douglas L. Roberts

JOHN DEERE

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For courageously advocating diversity and inclusion; for personally developing and advancing women into top leadership positions; and for building relationships that help eliminate barriers.

**D**ouglas L. Roberts, global director of the combine product line at John Deere's Agriculture and Turf Division, not only believes that gender diversity contributes to business success; his 19-year history with Deere proves it.

From his first assignment as a factory unit leader in 1998, to his current position, running a \$4.5 billion product line that employs 5,000 people in nine business units on four continents, Roberts has continued to mentor women engineers, advancing many into leadership positions. He now heads one of John Deere's most diverse management teams — a team that consistently overdelivers.

Since taking charge of the combine product line in 2009, Roberts' business has frequently excelled as an enterprisewide productivity leader. During the 2014-2015 global agricultural market contraction, it preserved profits, even as sales fell by half. Since then, it has kept the line competitive by reducing vehicle emissions across the board, innovating new products, and completing a major global reorganization — all while maintaining high morale and profits. The division achieved double-digit gains in employee engagement scores, overall profitability of 13 percent, and compound annual growth of 11 percent.

Since 2012, Roberts has increased the number of women engineers on his global leadership team by 63 percent and on his U.S. staff by 83 percent. Many of these women have shattered local glass ceilings with his help. His current global leadership team includes a first-ever female factory manager, operations manager, supply management manager, production supervisor, and production manager. Female team members

also lead human resources, operations, finance, and engineering.

Roberts, who retired in 1998 from a 21-year career with the U.S. Navy, believes everyone deserves an equal opportunity. He works hard to make that possible. He finds time, despite a demanding international management schedule, to personally mentor multiple women throughout the organization. He serves as a role model for other male executives and constantly pushes his business units to broaden their diversity and inclusion efforts.

A champion for diversity policies and programs, Roberts holds biannual internal talent reviews and constantly monitors his business units' diversity talent pipelines. From 2012-2014, he led and strengthened the team enrichment group, an enterprisewide effort to identify and advance diverse talent. He is currently piloting the Black Leadership Forum, a structured mentoring program for black engineers, at one of his largest factories. And he is implementing the Pre-Key program, an accelerated leadership development program for women engineers.

He actively supports the Society of Women Engineers within John Deere. He requires each crop-harvesting factory to send representatives to the SWE conference, and in 2014, he helped his employees found Brazil's first SWE international affiliate.

Roberts holds a B.S. in civil engineering from Iowa State University and an M.S. degree from Old Dominion University. He lives in Des Moines, Iowa, with his wife, Deb, and has two children. Roberts enjoys traveling, fishing, and spending time with his new granddaughter, Nella.

## RESNIK CHALLENGER MEDAL

## Terri Taylor

HONEYWELL AEROSPACE



For advances in spacecraft momentum control systems; for setting high standards for critical parts and systems; and for establishing a world-class testing lab for bearings used in spacecraft.

Terri Taylor is a senior technical manager at Honeywell Aerospace, where she has worked for 27 years. She is an innovator in the application and life extension of critical spin bearing technology for the momentum control system (MCS) that steers, stabilizes, and points spacecraft. The MCS is essential to both Earth-observing missions, such as Earth mapping and weather monitoring, and to deep-space missions, such as the Mars Reconnaissance Orbiter and the Galileo study of Jupiter.

After receiving a B.S. in mechanical engineering from the University of Pittsburgh in 1982, Taylor spent eight years in the aerospace defense industry, first at Good-year Aerospace, as a rotor balance analyst, then at Loral Defense Systems, as a noise control, stress, thermal, and mobility analyst. She joined Honeywell Aerospace in 1990 as a structural/thermal analyst and, in her long career there, has played a crucial role in technical advances for U.S. and international space exploration.

Honeywell Aerospace products are present on all manned spaceflights and roughly 70 percent of all space missions. Taylor has been a valued technical contributor and leader on the company's most significant space projects. These include mechanisms such as those on the International Space Station, as well as Reaction Wheel Assembly (RWA) and Control Moment Gyroscope (CMG) space-based missions, such as WorldView, and Iridium NEXT. More than 1,500 Honeywell RWAs and 150 CMGs have been launched without a single on-orbit failure within the product life requirement.

During testing for an important mission, it was observed that a bearing expected to endure harsh on orbit

conditions showed signs of distress during ground testing. After assembly of a team of customers, suppliers, consultants, and the world's foremost tribologists and bearing engineers to correct the problem, Taylor made it a priority to become a critical cleaning and cleanliness verification expert. The investigation revealed that the bearing failure was caused by insufficient cleanliness. She developed a cleaning process that addressed both molecular and particulate contamination, which is now considered the gold standard in the space industry. Taylor received the Secretary of the Air Force Director's Award for "exceptional performance and outstanding contribution to the mission."

Recognizing that Honeywell's bearing laboratory was not equipped to handle anomaly investigations of large magnitude, Taylor designed and set up a world-class lab capable of bearing inspection, verification, and processing. The lab is also equipped to perform the cleaning process she designed, operationalize test results, and rework bearings that do not meet standards for extended mission life.

Active professionally with the American Society of Testing Materials (ASTM), Taylor participated in the development of new standards on bearing cage materials and bearing cleanliness verification. At work, she is committed to mentoring Honeywell's next generation of bearing and mechanism engineers.

In her free time, Taylor enjoys hiking with her husband, Roger Nagel; reading presidential biographies; quilting; knitting; and vacationing at her cabin near Mancos, Colorado.



## WORK LIFE INTEGRATION AWARD

# Cindy Hoover

SPIRIT AEROSYSTEMS

For career accomplishments in aircraft manufacturing; and for bringing her influence, expertise, and persistence to the establishment of mother's rooms for all female employees at Spirit AeroSystems.

Cindy Hoover is vice president of the Boeing Twin-Aisle Programs at Spirit AeroSystems in Wichita, Kansas. She is responsible for profit and loss of the Boeing 747, 767, and 777 jet aircraft, and for development and execution of the 777X derivative program. She was previously vice president of the 737 MAX program and program director for the 767 tanker. Hoover has also held the positions of director of fuselage engineering for the 777, 767, and 747 family of twin-engine jets, and director of lean operations in the fuselage business division. Hoover came to Spirit in 2007 from LSI Corp., where she was director of customer operations and site manager for the Wichita facility.

Hoover is the founder and executive sponsor of Spirit Women in Engineering Professions and Technology (SWEPT), the company's employee resource group for women, which reaches some 350 of the company's female engineering and technical professionals. She also has three children and understands the challenges women face in integrating work and family. When a survey identified Spirit's lack of facilities for nursing mothers as a retention issue, Hoover took it seriously. Spirit's Wichita campus is a mile long and has 15.4 million square feet of office and manufacturing space, but before February 2015, there was only one location on campus available to nursing mothers. Inconvenience and distance forced many women to use restrooms or stop nursing before they were ready.

Acting quickly, Hoover converted one of her 737 MAX offices. She found furniture and a refrigerator and hung a "mother's room" sign on the door. Word spread, and several nursing mothers began to use the facility

regularly. Hoover was determined to establish a campus network of easy-to-access mother's rooms for all female employees. After negotiating with HR administrators, Hoover settled on a plan of shared space. She assembled a team of women to research options and implement the program. Budget, legal, and remodeling issues were hammered out, space allocated, and a communications strategy agreed on. The Spirit mother's room program was rolled out in May 2015. The program has improved quality of work life for female employees, brought the recognition of the state business community by receiving the Gold "Breastfeeding Employees Support Award," and has proved to be an effective retention and recruiting tool.

A graduate of Wichita State University, Hoover holds a B.S. in electrical engineering. She earned an executive MBA from Friends University and a Six Sigma black belt certification from Six Sigma Academy.

An involved member of the Wichita community, Hoover is vice chair of the board of trustees for the Sedgwick County Technical Education and Training Authority, which governs the Wichita Area Technical College. She has also served on the boards of United Way of the Plains, Girl Scouts of Kansas Heartland, Wichita Area Outlook Team, and the Wichita Regional Chamber of Commerce. She is active in SWE and has filled numerous leadership positions, including Society treasurer. In 2014, she received the Prism Award. Hoover and her husband, Bryan, have three sons. In her spare time, she enjoys WSU Shockers basketball, golf, scuba diving, and reading a good book.

## DISTINGUISHED ENGINEERING EDUCATOR

# Deborah O'Bannon, Ph.D., P.E., F.SWE

UNIVERSITY OF MISSOURI-KANSAS CITY



For revolutionizing civil engineering education; serving as a role model and mentor to female STEM faculty; and for demonstrating excellence in engineering, leadership, and community.

A professor, engineering education innovator, mentor, and broadcast expert, Deborah O'Bannon, Ph.D., P.E., F.SWE, has redesigned the way that the University of Missouri-Kansas City (UMKC) teaches classes in civil engineering. In addition, she has communicated her unique vision through a weekly radio program that ran from January 2009 to September 2011.

Dr. O'Bannon's reworking of a capstone class gives students a realistic look at engineering by working as a team for a client in the real world under the guidance of the professor. In 2009, the National Council of Examiners for Engineering and Surveying honored the class with one of the inaugural Engineering Awards for Connecting Professional Practice and Education.

As the host of the hourlong, weekly radio show "Building Kansas City," Dr. O'Bannon interviewed professionals to teach the public about bridge construction, stormwater, foundations, and other aspects of engineering. The show's listeners, as measured by Arbitron, grew to 3,000 per week in the Sunday morning time slot. Dr. O'Bannon leveraged the forum to share the ethics, responsibilities, and sheer imagination of engineers with her audience.

She also mentors other faculty members, including providing leadership training to the female science, technology, engineering, and mathematics (STEM) faculty. Dr. O'Bannon has served as a technical expert for the City of Kansas City's Wet Weather Community Panel, which guided the public water utility in improving water quality and reducing sewer overflows.

Dr. O'Bannon was the technical lead for monitoring the largest urban rain-garden installation in the United States. She worked with the U.S. Environmental Protection Agency from 2008-2013 to evaluate a 100-

acre watershed within Kansas City's combined sewer collection system to test the efficacy of 136 small rain gardens built within the public right-of-way (between sidewalk and street) in an eight-block urban, residential area. The rain gardens were instrumented for two years and yielded rich data sets.

She has published two books about water quality and surface water contamination and is currently serving as a volume editor for a book in the Springer Women in Engineering and Science Series, focusing on water quality, and is coordinating efforts of women throughout the U.S. and Europe to document their technical involvement in areas of water quality.

Dr. O'Bannon has written and presented many grant applications, scholarly conference papers, and teaching activities. An active SWE member for 25 years, her contributions and dedication were recognized by her selection as a Fellow in 2002. She has served on the Society board of directors; chaired the *SWE Magazine* editorial board; served on Society-level, region, and section committees; and held most Kansas City Section offices, including twice as president. She has served as the faculty advisor of the UMKC SWE section since she joined the faculty in 1989. At her urging, the section has an active relationship with both the Kansas City Section and the Society.

She earned a B.S. in civil engineering from the Massachusetts Institute of Technology, a Master of Engineering (environmental) from Manhattan College, and a Ph.D. in civil and environmental engineering from the University of Iowa.

Dr. O'Bannon enjoys cooking and bread baking, and even cooks on the road when she visits Israel annually.



## ADVOCATING WOMEN IN ENGINEERING AWARD

# Andrew Alleyne, Ph.D.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

For sustained and principled advocacy of women engineers; and for demonstrating that gender balance transforms an organization, making it more productive as well as more inclusive.

Andrew Alleyne, Ph.D., is the Ralph and Catherine Fisher Professor of Engineering in the department of mechanical science and engineering at the University of Illinois at Urbana-Champaign (UIUC). He conducts research and teaches classes on decision-making in complex systems and directs the Power Optimization for Electro-Thermal Systems (POETS) center, an NSF engineering research center focused on increasing the power density of mobile electrified systems.

Dr. Alleyne joined UIUC in 1994 as an assistant professor. He became a full professor in 2004 — the youngest person to achieve that rank in the history of his department. He has served as associate dean for research in 2008, and in 2014 was appointed to associate head of undergraduate programs. He has served on key university committees, including budget, promotions and tenure, and diversity. He has held visiting appointments at ETH Zurich; the University of Colorado Boulder; and, through a Fulbright fellowship, the Delft University of Technology in the Netherlands. He is an ASME fellow and a member of the U.S. Air Force Scientific Advisory Board.

Acting on a lifelong conviction that well-managed, diverse environments outperform homogeneous ones, Dr. Alleyne has taken the initiative to seek out and hire women faculty, transforming the culture of his department and that of the College of Engineering. He has viewed every personal career gain as an opportunity to advocate more effectively for diversity. After earning tenure, he increased the number of female graduate students in his research group from 10 percent to a running average of 33 to 50 percent and saw a 50

percent increase in productivity, as measured by papers, citations, and funding. The results of this experiment supported his belief in the power of gender balance.

When Dr. Alleyne joined UIUC in 1994, there were no women faculty in the department of mechanical science and engineering (MechSE), and the College of Engineering faculty was 90 percent male. Determined to affect the faculty hiring process, he served two terms on the recruiting committee, from 2006 to 2011 and from 2012 to 2014, most of that time as chair. As a result of Dr. Alleyne's leadership, the MechSE faculty is now 25 percent female. This change has led to an increase in female engineering students, with a current first-year undergraduate class of 30 percent — a historic high.

Improving the department's gender balance involved a lot of hard work over time — including reading hundreds of applications. Dr. Alleyne developed a 10-step plan for hiring high-quality, diverse candidates that has been shared with Purdue and Texas A&M. He is also dedicated to career advancement for his female colleagues, including their specialties in his grant proposals, advocating their tenure, and nominating them for honors and awards. He has underwritten the launch of a GradSWE project, and opened his lab to women researchers, including covering equipment costs when necessary.

Dr. Alleyne earned his B.S.E. in aerospace engineering from Princeton University and his M.S. and Ph.D. degrees in mechanical engineering from the University of California, Berkeley.

Marianne, his wife of 22 years, teaches in the School of Integrative Biology at UIUC. They have two sons.



## ADVOCATING WOMEN IN ENGINEERING AWARD

# Imelda G. Castro

INTEL CORPORATION



For inspirational leadership in global inclusion — especially for Hispanic and underrepresented women; for cutting-edge technical learning expertise; and for guiding countless women to success in the STEM workplace.

Growing up in rural, northern New Mexico, Imelda G. Castro absorbed this message from her parents, both teachers: “No excuses.” Encouraged to work hard and excel, Castro was valedictorian of her high school class; won an academic scholarship to New Mexico State University, where she received a bachelor’s degree in business administration; and earned a bachelor of science in secondary education from The University of New Mexico. She is also a graduate of the UCLA Latino Leadership Institute program and the University of Virginia Darden School of Management “Leading for Extraordinary Results” program.

Castro joined Intel in 1982 as a member of the start-up team for the company’s first factory in New Mexico. She has held many engineering management positions in Intel’s technology manufacturing group (TMG) in technical training, quality and reliability engineering, materials management, capacity management, supply chain management, software engineering, and technical workforce capability. Under her co-leadership, her cross-organizational team was recognized with the Intel Achievement Award for developing and implementing Intel’s capital equipment reuse program.

Since 2007, Castro has been director of equipment workforce capability in TMG. She leads an organization staffed by supply chain engineers, human performance technology engineers, and software engineers. She oversees the labor portion of the worldwide supply chain that service and maintain the billions of dollars of factory equipment that produce Intel’s processors. Her team develops the company’s high intellectual property process engineering training and develops software systems for learning, certification, and labor management in TMG. Castro is an expert in technical learning, and she and her team have been recognized for innovative workforce solutions from the American

Society for Training and Development (now the Association for Talent Development), Corporate University Xchange, World Procurement Leaders, and SCM World (a Gartner Community).

Throughout her career, Castro has advocated diversity and inclusion strategies for women, Latinos, and underrepresented minorities. Castro is the senior sponsor for the Arizona Women at Intel Network (WIN), an employee resource group that holds career-development conferences, mentoring, and networking events. Under Castro’s 18-year leadership, Arizona WIN membership grew from 20 to 1,100 members. She is one of the leaders credited with expanding WIN to 46 chapters and 5,500 members worldwide, making it Intel’s largest employee resource group. Arizona WIN has received many awards for advancing women and developing leaders, four of whom are SWE Emerging Leader award recipients.

In 2005, galvanized by her time at the UCLA Latino Leadership Institute, Castro co-founded Intel’s Hispanic Leadership Council (IHLC), an assembly of the company’s most senior Hispanic leaders. She co-chairs the IHLC, doing recruiting, public speaking, mentoring, and sponsorship initiatives to meet the company’s hiring and retention goals. IHLC received the 2016 Intel Global Diversity and Inclusion Leadership Council of the Year Achievement Award. Castro received the 2017 Society of Hispanic Professional Engineers STAR Diversity Award and an Intel Lifetime Achievement Award for her impact on behalf of the company’s female and Hispanic employees.

Castro and her husband have two daughters: Breanna, a graduate of the Academy of Art University in San Francisco, and Kathleen, a senior at The University of Arizona.



## ADVOCATING WOMEN IN ENGINEERING AWARD

# Heidi Millard Kenkel

JOHN DEERE

For succeeding in “being the change she wants to see in the world” through an extraordinary commitment to inspiring young women and girls to pursue engineering.

A leading light in John Deere SWE, Heidi Millard Kenkel recently became the field test verification supervisor for John Deere Waterloo Works in Iowa. Kenkel also directs the John Deere SWE outreach committee, which sponsors Introduce a Girl to Engineering Day events in 15 locations and five countries, exposing 1,300 young women to the rewards of engineering. She has mentored countless women — both individually and in group settings — at John Deere, and her team delivers an intern mentoring program that now operates at many of the U.S. company sites.

Committed to increasing awareness of STEM careers for women and girls, Kenkel has made community involvement a priority. She works with SWE and at John Deere to inspire girls to pursue engineering. She has served on the steering committee and as communications chair of WomenREACH, one of John Deere’s most active employee networks. She welcomes new employees — especially women engineers — and makes sure they know about opportunities in the company.

She has been a SWE member since she was a student at Michigan Technological University, and for a time after graduation, was active as a member at large. She is a founding member of the Cedar Valley Section and served as section chartering advisor. With Kenkel’s guidance, the section initiated several professional development, networking, and outreach events. One of the most successful is a partnership with Waterloo public schools that sets up one-on-one mentoring for girls in fourth through eighth grades, a time when many girls become discouraged about their potential. Kenkel is also an advisor for the annual Expanding Your

Horizons conference, which enables 150 fifth- through eighth-grade girls to participate in STEM workshops with professional engineers.

Kenkel joined John Deere in 1996 as a design engineer. Among her current job responsibilities are leading large tractor testing for North America and Europe; developing and managing the budget for test tractors and test sites; and delivering weekly field test results to management groups. She has worked in a variety of positions and areas, including design, test, quality, reliability, operations, and human resources. While in human resources, she revamped the recruiting process at Waterloo and throughout John Deere. She received two division manager awards for her work in drivetrain test. When she joined the quality organization, Kenkel was instrumental in developing and launching an enterprise system for nonconformances and corrective action. In 2004, she became a senior reliability engineer with responsibility for utility tractors and for building relationships with colleagues all over the world. In 2011, Kenkel returned to the reliability division as a project manager. In 2013, she was recognized by the company CEO as part of the IT4 Quality Improvement Team for Delivering Distinctive Quality.

Kenkel earned an undergraduate degree in mechanical engineering from Michigan Technological University, an MBA from The University of Iowa, and a master’s in systems engineering from Iowa State University. In her spare time, she enjoys spending time with her husband and three sons, attending her children’s sporting events, and helping with their scouting activities.

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## ADVOCATING WOMEN IN ENGINEERING AWARD

# Corlis Murray

ABBOTT




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For driving diversity in STEM at work and in the community; for managing change with clarity and compassion; and for making a positive, enduring impact on every life she touches.

Corlis Murray is senior vice president, quality assurance, regulatory and engineering services at Abbott, a Fortune 150 global health care company. Murray's appointment in 2012 to this post marked a number of firsts: She was the first African-American to lead Abbott's corporate quality organization; the first African-American woman to serve as senior vice president in the company; and the first African-American in Abbott's history to report directly to the CEO. She oversees corporate policy around regulations and works with Abbott businesses to ensure compliance with local, federal, and international regulations. She also anticipates, tracks, and responds to emerging issues.

Murray joined Abbott in 1989 and has held management positions in quality, operations, and engineering in Abbott's diagnostics and nutrition businesses. As chair of the Engineering Executive Council from 2009 to 2010, she was the first African-American and the first woman to serve in this capacity. She has been involved with key engineering development moves and new product launches, and has provided leadership on executive crisis-management teams, including for the 2011 earthquake and tsunami in Japan and the 2009 HiNi influenza pandemic.

Convinced that young people need to see people who look like them in the professions that interest them, Murray works both inside and outside of Abbott to encourage and empower young women and minorities to pursue science, technology, engineering, and mathematics (STEM) careers. She is a founding member of Abbott's Women Leaders in Action, an organization that has supported the careers of thousands of employees. She is a tireless mentor and has coached countless students, colleagues, and Abbott employees, contribut-

ing her time, expertise, and counsel to help them thrive at work and create the careers they want. She has built on Abbott's relationship with Howard University and forged new connections with the HBCU, establishing the Adopted Engineer program. Murray also serves as Abbott's executive mentoring program sponsor to North Carolina A&T State University, the nation's largest HBCU.

In 2012, Murray launched Abbott's high school STEM internship program, which targets students from groups that are underrepresented in technical fields. The program enables young people to work side by side with Abbott engineers on real engineering projects and apply their academic training. So far, 88 young people have participated in the program, and 97 percent have pursued STEM degrees or landed STEM jobs. Last summer, two-thirds of interns were young women, and nearly 60 percent were minorities.

The recipient of many awards and honors, Murray has been named to *Black Enterprise's* 50 Most Powerful Women in Business list twice, recognized by the Whitney M. Young Jr. Service Award by the Boy Scouts of America Northeast Illinois Council for mentoring, and named Black Engineer of the Year Award Program Scientist of the Year. She sits on the Clara Abbott board of directors and on several Abbott executive committees.

Prior to joining Abbott, Murray worked at Recognition Equipment and Xerox Corporation.

She holds a B.S. in mechanical engineering from Southern University in Baton Rouge, Louisiana.

Murray enjoys spending time with family, supporting grandchildren's activities, long walks with her husband, supporting her church and community, and encouraging youth as they attend or prepare to attend college.



## ADVOCATING WOMEN IN ENGINEERING AWARD

# Cynthia Reid, P.E.

LORD CORPORATION

For bravely defending women in the workplace, resulting in improved policies and attitudes; and for tireless advocacy of women through SWE and ASME.

Cynthia Reid, P.E., is a staff engineer in the aerospace product support engineering group at LORD Corporation in Erie, Pennsylvania, where she works on in-production and legacy fixed-wing and rotary-wing engine mounting products. She is the sole fixed-wing engineer in her group, responsible for all product support issues on all fixed-wing products in active service around the world. She maintains all the component maintenance manuals for in-service LORD products and conducts training on manual creation and on Simplified Technical English. Reid has worked on all product lines in the Aerospace Division and is the company's top expert on turboprop aircraft engine mount applications.

One of the first female engineers hired by LORD, Reid has more seniority than any other woman in a technical position in the company. She has consistently leveraged her experience and reputation to serve as an advocate for other women. In the 1980s, when the culture in the corporate world was less than welcoming for women engineers, Reid worked hard to dispel stereotypes by setting a high bar for her own technical accomplishments and professional behavior, and by confronting the tough issues she and her female colleagues faced. She worked with the human resources department to help them understand the impact of sexual harassment on women. Her advocacy helped curtail negative behavior and resulted in improved policies and attitudes at the company. Reid also challenged a 1990s dress code that affected all women employees and succeeded in getting it revoked.

Since the female engineering population at LORD has always been small, Reid reaches out to new hires, helping them advance their careers and organizing networking social events. She is a careful and thoughtful mentor, making sure that student interns are given appropriate assignments and receive complete reviews of their work. Through LORD, Reid volunteers for the School-to-Industry Chemistry outreach, Junior Achievement's JA in a Day program, and the Women in Science and Engineering (WISE) program at Penn State Erie. She leads the LORD presentation in the Math Options Program, also at Penn State Erie, and last year received the Math Options Vision and Passion Award.

Reid has been an active member of both SWE and The American Society of Mechanical Engineers (ASME) her entire career. She served as chair of ASME and was the alternate SWE MAL representative for many years. She has used these leadership positions to raise the visibility of women engineers within LORD. She has also been a judge for the Pennsylvania Junior Academy of Science Regional Competition for more than 20 years and speaks at schools throughout the Erie area.

She graduated from The Pennsylvania State University with a B.S. in mechanical engineering and has been a registered professional engineer in Pennsylvania since 1986. Reid enjoys music and plays in several regional bands and orchestras. She is married and has one grown son.

## GLOBAL LEADERSHIP AWARD

## Maryann Combs

GENERAL MOTORS



For two decades of global leadership; for commitment to mentoring women engineers throughout the world; and for motivating a diverse group of employees to reach greater heights.

In her current role, Maryann Combs, executive director, global functional leader of validation, General Motors, leads a global team responsible for ensuring all vehicles worldwide meet customer, safety, and regulatory requirements.

She also serves as global product development leader for workplace safety, as well as the global validation position, directing resources for more than 1,500 employees worldwide and a budget of more than \$100 million globally.

Combs continues to mentor women — and primarily women engineers — from the beginning of their careers to the executive level across the world. Having begun her career at GM after high school, she is well aware of the skills needed to succeed in a male-dominated workplace.

She mentors more than a dozen women, covering four continents, both formally and informally; participates in Women's Boot Camp for leadership development in engineering and manufacturing within GM; and takes part in global product development and GM companywide human resources forums for women trying to foster career development toward careers in engineering, science, and technology.

Prior to her current position, Combs served as president of Pan Asia Technical Automotive Center (PATAC) Company Ltd., in Shanghai, during which time she received the Magnolia Award honoring foreign experts, scholars, and entrepreneurs who made outstanding contributions to the economic and social development of that city.

Before working in China, Combs was the executive champion for the GM *FIRST*® Robotics teams in the United States and Canada. In fact, throughout her career, she has mentored students of all ages to develop an interest in STEM careers.

Combs has held many other roles during her career, including executive director of electrical systems, controls, and software for GM North America prior to her move to China in 2007.

She expertly balances these responsibilities with her roles as wife and mother in Oakland, Michigan. She received a bachelor's degree in electrical engineering from Kettering University, a master's in electrical engineering from Purdue University, and a master's in business administration from the Massachusetts Institute of Technology, where she was a GM Sloan Fellow.

During her nearly five years in China, Combs worked at the primary Engineering Center for SAIC-GM, a joint venture between GM and SAIC to design, develop, and validate vehicle architecture, engines, transmissions, and electrification solutions for both SAIC-GM in China and GM globally.

Among Combs' accomplishments are developing a standardized work site to document major processes and critical activities so engineers may apply them consistently worldwide, and establishing a global framework for automation that is critical for software-intensive areas such as infotainment and active safety.

Combs and her husband, Sean, have four children. She enjoys golf, solving puzzles, and spending time with her family.



## GLOBAL LEADERSHIP AWARD

# Karen Ramsey-Idem, Ph.D.

CUMMINS INC.

For being a technical leader and a champion of women from India and China to Europe to South America and the United States, and for increasing corporate diversity and inclusion.

As director of global technical resources for the Cummins Components Business Unit (CBU), Karen Ramsey-Idem, Ph.D., is responsible for the company's technical capital portfolio strategy and developed a tool to assess and compare the well-being of existing capital assets. She coaches others in the use of this unique concept and leads its application across the company's major investments including manufacturing plants, offices, and technical facilities. This tool improves overall capital portfolio management and promotes deliberate investment decisions. The global technical centers are critical to the company's technology and product development and validation work.

Previously, Dr. Ramsey-Idem was director of global technical resources and strategy for Cummins Inc. In this position, she led capital investment for technical organizations in the business units of engine, power generation, components, and distribution, and adapted a process used for new manufacturing plant start-ups so it could be used for technical center projects.

This work is enhanced by Dr. Ramsey-Idem's technical expertise in materials engineering and product validation testing, which require significant capital investments and management of those assets. She has developed processes for global facilities in all aspects of product validation engineering, guiding disparate groups toward an aligned global team of experts.

Prior to that role, she led the Technical Functional Excellence organization at Cummins Research and Technology India Ltd. (CRTI), marking her first international assignment. There, she worked to leverage the talent in India and to increase the size of the team from 125 to more than 400 engineers, focusing on increasing gender diversity and inclusion. She developed and implemented the process now deployed globally to

ensure analysts and designers are equipped with the latest technologies and tools.

Dr. Ramsey-Idem joined Cummins Filtration in 1997, where she held a variety of positions, including director of the Engineering Services Organization, supporting global technical work such as drafting, design, analysis, lab operations, and capital project planning and execution. As global director for Cummins Filtration, Dr. Ramsey-Idem was responsible for technical lab operations at five locations worldwide — U.S. (Tennessee and Wisconsin); France; China; and India.

Dr. Ramsey-Idem also worked for NASA at the Kennedy Space Center and for The Dow Chemical Co. in Plaquemine, Louisiana.

Active with the Society of Women Engineers, Dr. Ramsey-Idem's past leadership roles include Region D governor and co-chair of the Corporate Partnership Council. Currently, she is technical project leader for RePower, the Cummins STEM re-entry program, which was developed in collaboration with SWE and iRelaunch. She also participates in SWE roundtables and conferences in India and Europe, and facilitates Cummins employee involvement in SWE's global affiliates and ambassadors program. She also supports the Cummins College of Engineering for Women SWE affiliate (India) and coaches members of the professional SWE affiliates in Pune and Bangalore, India.

She holds a B.S., M.S., and Ph.D. in mechanical engineering from Tennessee Technological University in Cookeville, Tennessee.

Not only does Dr. Ramsey-Idem lead hundreds of team members, whom she recruits and mentors, but she also manages to maintain a balanced family life. She and her husband, Steve, have three adult children — two daughters and a son.

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**GLOBAL LEADERSHIP AWARD**

## Liz Ruetsch

KEYSIGHT TECHNOLOGIES




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For an exceptional résumé of international technical and managerial achievements; for global impact on business and employees; and for a drive to support diversity.

In her position as director of worldwide sales, services, and support of Keysight Technologies' Electronic Design Automation (EDA) software business, Liz Ruetsch continues her 24 years with the company in varying and increasing responsibilities. She is third in line to the chief technology officer at Keysight, and is responsible for leading Keysight's EDA team. During her short time with the team, Ruetsch implemented an entirely new multiyear contract model for her software and services, resulting in greater than 10 percent compound annual growth at 30 major accounts on a global basis.

Prior to her current position, Ruetsch was marketing manager for the Oscilloscope and Protocol Division located in Colorado Springs, Colorado, and, previously, the strategic marketing manager at the company's China Communications Operation in Beijing.

In 2014, while in the position in China, Ruetsch grew the business by greater than 20 percent YoY by collaborating with customers on the China 4G expansion, and early R&D for 5G systems. She managed all areas of marketing, including product planning, product marketing, pre-sales support, post-sales support, and business development. She worked with leading accounts in China on Strategic Collaborations including China Mobile (CMCC) and Huawei. As a result of this work, Huawei granted Keysight its Strategic Collaboration Partner Award in 2017.

In 2009, while based in Santa Rosa, California, Ruetsch also took her efforts to a worldwide level, leading the fastest transition of a new product in company history during the PSA to PXA migration of Keysight's flagship signal analyzer platform. She led a diverse, global team to make the transition occur at 3x the historical pace of any major platform. As a result of her efforts, the team was selected for the CEO's Innovation Award in 2010 from more than 650 entries.

Prior to her work with Keysight, Ruetsch was sales and software manager with Agilent Technologies,

Microwave and Communications Division, Electronic Measurements Group, where she led a team of application experts based in the United States, China, and Japan responsible for product planning, product marketing, and business development for aerospace and defense, and wireless markets.

She also served as worldwide sales manager at Agilent Technologies Signal Analysis Division, Electronic Measurements Group, where she was responsible for exceeding sales targets by leading both business development and technical support teams. During this time, she had the opportunity to manage direct reports in more than 14 countries.

Ruetsch holds a bachelor's degree in electrical engineering from Rutgers University and an MBA from Boston University, executive program. At Rutgers, she joined SWE and took on leadership roles, including co-president for two years, helping grow the section from 10 to 150 members in a 12-month period. She re-engaged with her now local section, Silicon Valley, by participating in the "Leading from the Inside Out" panel at the WE Local event in San Jose this past February.

She has distinguished herself by raising more than \$150,000 for various charities in her lifetime, mentoring other professionals, and volunteering to help children learn essential skills and gain self-confidence. Ruetsch sat on the board of directors for an after-school program in inner-city Boston for 10 years, including driving the donation of a major computer lab from HP to the program. In addition, Ruetsch coached girls youth soccer for six years.

Among her many accomplishments, she was the first "Iron Woman" to complete the Greenway Challenge Triathlon. Ruetsch also enjoys travel, running, biking, hiking, skiing, and photography.




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**GLOBAL TEAM LEADERSHIP AWARD**

# Intel Global Water Conservation Team, led by Fawn Bergen

INTEL CORPORATION

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For exemplifying a culture of fostering innovation; for celebrating and promoting diversity of thought; and for achieving outstanding results of vital worldwide importance.

As part of Intel's efforts to conserve large amounts of water in its manufacturing process, three women led a team that put in place one of the largest collective yearly water savings in the company's history.

Elizabeth Betancourt, P.E.; Irina Belozerova, Ph.D.; and Fawn Bergen, P.E., led the global water conservation team that streamlined managing and tracking projects, thereby increasing their visibility, and improved the accuracy of project reporting.

The world's largest semiconductor manufacturer, Intel uses water in many applications, including "ultrapure" water, to rinse semiconductor wafers. Engineers Betancourt and Dr. Belozerova were joined by Bergen to conserve water not only in manufacturing, but also in landscaping, office buildings, kitchen cafes, and cooling towers.

Beginning at their work sites in Arizona and Oregon, they recruited others from Israel and Ireland in 2015 (Ofer Navot and Alan Gannon), and took yet another step with the addition of Bergen in 2016. She recruited key business units and others to represent all nonmanufacturing areas of Intel. They, in turn, were challenged to save 400 million gallons of water per year in 2016.

Not only did they meet that challenge, but the Global Water Conservation Team far surpassed it with more than two-and-a-half times that amount saved, for a total of 1 billion gallons of water — earning them the Gold Prize in Intel's annual Environmental Excellence Award.

With their team members from Israel and Ireland, Betancourt, Dr. Belozerova, and Bergen served different roles to facilitate the concerns that working across different countries, languages, customs, and cultures

presented. At times, even scheduling meetings was a challenge. By sharing constructive feedback, the team approached these and other issues by listening, sharing concerns, and solving problems constructively.

The team also had to overcome technical and administrative challenges for site-specific projects. For example, ion exchange regeneration changes underwent in-depth internal technical reviews before final approval. The same methodology facilitated highly efficient and timely transfer to other sites, however, so, without additional piloting, data collection, or reviews, this approach was implemented on a variety of applicable ultrapure water systems.

The team also identified opportunities for water savings arising from regular equipment maintenance, such as rinse times for filters, membranes and resin, and ion exchange chemical regeneration duration. Reducing the amount of water spent for rinses (via either lower flow rate or duration) resulted in significant water savings without impacting the process or equipment. Finally, in the reclaim space, collecting new wastewater flows into existing recycle systems was completed, and a separate, truly innovative project was accomplished. Circumventing a standard solution for wastewater recovery (installation of a new treatment system) in 2015 and 2016, engineers worked to direct multifactory waste streams into a single treatment process for most efficient use and cost savings.

By implementing real change, these team leaders achieved exceptional results. Despite different local and regional wastewater quality, the team overcame the problem with further wastewater treatment, among other ideas.



## PRISM AWARD

## Joan Chinnery, P.E.

THE BOEING COMPANY



For bridging the technical and military worlds with inspiring leadership; and for enlisting her advocacy and enthusiasm in support of SWE, the community, and on-ramping women engineers.

Joan Chinnery is a senior systems engineer at The Boeing Company, working on Canadian certification of the Chinook medium-to-heavy lift helicopter production and the accreditation of Boeing's in-service support program in Philadelphia. She authored the certification plan, and with her team has achieved many additional compliance, process, and documentation milestones. In 2011, Chinnery co-authored an American Helicopter Society paper that continues to serve as a baseline guide for navigating the intricacies of certifying legacy military aircraft and the accreditation process of foreign military airworthiness authorities.

Chinnery began her engineering career as the only female engineering officer with the Royal Canadian Air Force at Canada's largest fighter base in Cold Lake, Alberta. Initially, she supervised a 24/7 Base Flight operation that provided servicing and daily maintenance for a variety of domestic and visiting NATO aircraft. Later, as the mechanical support officer, she was responsible for more than 120 technicians performing second-line aircraft maintenance on all base aircraft and developed an aircraft composite skin repair that was approved by the Canadian Technical Airworthiness Authority and immediately incorporated into aircraft maintenance manuals.

After fulfilling her military commitment, Captain Chinnery joined Boeing in Philadelphia as a reliability engineer on the Chinook helicopter program. She pursued additional opportunities with Boeing in Washington state as a lead mechanical engineer in the commercial payloads certification organization. Then, as a certification liaison engineer for the 747 and 767 aircraft interiors, she ensured design quality and compliance with FAA regulations.

In mid-career, Chinnery off-ramped to raise and home educate her five children, all of whom are now successfully pursuing STEM careers. During her 16 years away from traditional engineering work, she and her husband started and grew an online business with annual sales exceeding \$250,000. Their business continues to thrive even today.

In addition to her current role, Chinnery is Boeing's focal to SWE, where she secures and manages funding for Boeing's presence at the Society's annual conferences. In the community, she served as president of SWE's DelMar Peninsula Section. Her enthusiasm and drive has significantly increased her section's participation and the number of opportunities for the involvement of other members. Chinnery has held numerous SWE positions, both within Boeing and her SWE section; attended and worked at several annual and regional conferences; and hosted various SWE events in the community and at Boeing's Philadelphia site. She is a strong advocate, a generous mentor, and an enthusiastic example to aspiring engineering students, to her engineering colleagues, and to on-ramping women engineers.

Chinnery earned a B.S. in mechanical engineering in Canada from Queen's University at Kingston. She completed postgraduate work to obtain an aerospace engineering specialty, holds a professional engineer's license, and has completed the Dale Carnegie public speaking course. Chinnery married her high school sweetheart and enjoys spending her free time with her family.




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**PRISM AWARD**

## Lisa Depew

MCAFFEE

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For serving as a transformational change agent in her career and community; and for enriching the conversation of what it means to be a successful woman in STEM.

Lisa Depew has spent nearly two decades driving transformational results at Intel Corporation, and is currently head of industry and academic outreach for McAfee, one of the world's largest pure-play cybersecurity companies. In her early career, Depew provided applications engineering support to multinational corporations, enabling customers to successfully design Intel-based products, and was instrumental in the team's successful expansion to Shanghai.

She later moved to Intel's Sales and Marketing Group to drive automation initiatives for reviewing customer designs. In this role, she built a design review services team, concurrently managing support of 16 Intel server, desktop, mobile, and embedded products. In one year, her team reviewed and found critical flaws in customer designs representing nearly \$500 million in Intel silicon sales.

Next, Depew drove support strategy for more than 100 million business PCs in Intel's PC Client Group. Her leadership greatly improved her department's responsiveness standards, grew capabilities fourfold with decreased headcount, and routinely scaled through partners to optimize the end-user support experience.

Most recently, Depew served as technical assistant and chief of staff to Intel Security's chief technology officer, working to identify, evaluate, and prioritize new technologies and ensure technical leaders throughout the corporation were effectively resolving challenges as they designed industry-leading security solutions. She was also responsible for all communications and management of the CTO office, including executive keynotes, internal and industry presentations, customer engagements, and interactions with public relations worldwide. She reached even further, to personally champion and institute a structured program for technical leadership development in the

newly formed 7,000-person organization. Depew was instrumental in establishing a culture of broad, organic innovation, exceptional technical performance, and strategic impact, and her programs provided the foundation for technical leadership development at the newly formed McAfee.

Currently, Depew serves as McAfee head of industry and academic outreach, working with both public and private sectors to close the skills gap and shape the cybersecurity workforce of tomorrow. Here, she leads K-12, collegiate, and professional skills (re-)training initiatives to educate, inspire, and empower the world's future cybersecurity workforce.

Depew is an outspoken advocate for diversity and inclusion initiatives, and for advancing STEM education worldwide. She has played a key role in retaining Intel and McAfee's top technical talent. She led the Technical Women's Initiative for Intel's Folsom, California, site; leads activities for her local SWE section; and has taught computer literacy to children and women in remote regions of Africa. Depew routinely speaks at conferences about the importance of technical talent development — including recognizing and removing unconscious bias — and supports departments around the world in defining and implementing successful work/life integration solutions for working parents.

Depew has been pictured in *Working Mother* magazine and highlighted in MSNBC.com's "Working Moms Redefining Success." She holds a B.S. in electrical engineering from the University of Dayton. Depew enjoys volunteering, travel, and relaxing with a good book. She and her husband are happily raising two active sons, and she is passionate about empowering her children and others to achieve their potential and make a positive difference in the world.

## PRISM AWARD

## Colleen M. Layman, P.E.

HDR INC.



For the determination and expertise to move industrial water treatment technology to the next level; for deep commitment to SWE; and for inspiring and empowering women to pursue roles in STEM.

Colleen M. Layman, P.E., is a vice president and director of professional engineering services for HDR, an engineering, architecture, environmental, and construction services firm headquartered in Omaha, Nebraska. In this role, she directs the corporation's engineering activities and leads a technical staff of approximately 1,200 engineers and scientists who work on industrial private sector projects around the world. Her responsibilities include enhancing and managing implementation of corporate QA/QC and risk assessment processes, vetting emerging technologies for application, growing organization technical competencies, developing technical production approaches, technically assessing potential corporate acquisitions, and overseeing technical resources for project pursuits and engineering service lines.

Working first as a technician and later as an engineer in the power industry, Layman's technical passion has always been water and wastewater treatment for the energy sector. She has authored more than 20 publications, presented workshops and training courses, and served as leader on many technical committees. Prior to joining HDR, she worked for engineering, procurement, and construction companies designing and building power plants. Throughout her career, Layman has worked in virtually every aspect of the power plant life cycle, including design, construction, commissioning, and operations, in the office and in the field.

She holds a B.S. in mechanical engineering technology, an M.S. in water resources and environmental

engineering, and an MBA, all obtained on a part-time basis while she worked full time. She is licensed as a professional engineer in three states, and is a certified Institute for Sustainable Infrastructure Envision Sustainability Professional.

An active SWE member for nearly 20 years, Layman served as FY16 president. In other Society-level roles, she has been a member of the awards, scholarship, nominating, and finance committees and was director of regions. Now a senior life member, she demonstrates a passionate commitment to SWE's mission through leadership and dedication that extends far beyond a volunteer role.

In 2013, Layman founded and served as the first chairperson for HDR's Women in Science and Engineering (WISE) networking group designed to help women within HDR develop their leadership skills.

Layman has served on the board of directors for the Engineers' Society of Western Pennsylvania and the International Society of Automation, and has been active on the American Society of Mechanical Engineers' research and technology committee on water and steam in thermal systems, and the performance test code committee for a number of years.

She lives in Whitewater, Wisconsin, with her fiancé, Mark, and their three furry feline children. Layman is an avid scuba diver, and has worked as a Professional Association of Diving Instructors professional, helping others learn to dive and grow their appreciation of the underwater world.



## PRISM AWARD

# Leslie M. Phinney, Ph.D.

SANDIA NATIONAL LABORATORIES

For groundbreaking research in the fields of radiation interactions with microsystems, and thermophysics effects on MEMS, seamlessly paired with a distinguished record of teaching, student mentorship, and professional service.

Leslie M. Phinney, Ph.D., is a principal member of the technical staff of the Engineering Sciences Center at Sandia National Laboratories (SNL) in Albuquerque, New Mexico. Her research is focused on heat transfer, thermosciences, and microsystems, with an emphasis on microscale heat transfer, thermal analysis and simulation, thermal microactuators, experimental techniques, thermomechanical effects, laser processing, adhesion in microsystems, and microelectromechanical systems (MEMS) reliability testing.

Dr. Phinney joined SNL in 2003 as a member of its senior technical staff. By 2012, she had risen to a rotational position in the chief technology officer programs office department, focusing on improving the research environment and interactions between mission and research efforts at SNL, before assuming her current role.

Her record of professional service is extensive. She is a fellow of the American Society of Mechanical Engineers (ASME) and a recipient of a National Science Foundation (NSF) CAREER Award. She is a member of The University of Texas at Austin mechanical engineering department's external advisory committee and was on the advisory board for the Cooling Technologies Research Center at Purdue University for five years. She has served on the ASME Heat Transfer Division K-8 theory and fundamental research committee since 1997, including terms as secretary, vice chair, and chair. Additionally, she served on the ASME International Mechanical Engineering Congress and Exposition

steering committee and the K-2 long range directions and issues in heat transfer committee.

Dr. Phinney has authored 49 peer-reviewed journal articles and 51 conference papers and has given dozens of seminars, tutorials, and presentations at universities, national laboratories, companies, and technical conferences. She has served as track, topic, and/or session chair at more than 25 ASME conferences, and has been a reviewer for more than 15 journals, the U.S. Department of Energy, and NASA, as well as serving on NSF review panels.

She earned her B.S. in aerospace engineering from The University of Texas at Austin. On a Churchill Scholarship, she earned a certificate of postgraduate studies from the University of Cambridge, followed by an M.S. and Ph.D. in mechanical engineering from the University of California, Berkeley. She was a member of the mechanical and industrial engineering department faculty at the University of Illinois at Urbana-Champaign from 1997 until 2003.

Dr. Phinney is devoted to finding solutions to the issues affecting women in STEM. Her volunteering has supported the SNL Division 1000 Workplace Enhancement Council; SWE's Central New Mexico Section, where she is a SWE life member; the Sandia Women's Action Network; the New Mexico Engineering Foundation; the Junior League of Albuquerque; and the Albuquerque Rose Society.

When she is not working, Dr. Phinney enjoys reading, hiking, and visiting family and friends.

## PRISM AWARD

# Anna Prakash, Ph.D.

INTEL CORPORATION



For vast technical knowledge and expertise in electronics packaging materials; and for depth and breadth of STEM advocacy for girls, young women, the underrepresented, and the underserved children in local communities.

Anna Prakash, Ph.D., is a senior materials engineer in the Technology and Manufacturing group (TMG/GSM), Systems and Components Engineering, Intel Corporation. During her 13 years with Intel, she has developed leading-edge material technologies across multiple complex semiconductor packaging programs and optical-electronic packaging programs, such as the Intel® RealSense™ camera modules, and Silicon Photonics technologies used in market-leading Intel products.

Among Dr. Prakash's notable accomplishments at Intel is the development of the industry's first environmentally friendly semiconductor packaging flux materials. These novel materials enabled Intel to implement an industry conversion to environmentally friendly, lead-free, and halogen-free packaging technologies. Today, Intel and all its products are compliant with restrictions of hazardous substances, meeting the company's corporate vision for green electronic products.

Prior to joining Intel, Dr. Prakash developed Surface Plasmon Resonance (SPR) sensor technologies at Arizona State University under the guidance of Karl Booksh, Ph.D., for environmental and biomedical applications. She also worked at Three-Five Systems Inc. as a senior project engineer, enabling low-power color display products from design to manufacturing using Liquid Crystal materials and Liquid Crystal-on-Silicon technologies.

Throughout her career, Dr. Prakash has fostered innovative thinking and technical problem solving. In addition to being a key contributor to numerous technical papers in *Intel Assembly and Test Technology Journal*, Dr. Prakash is a prolific inventor with more than 20 patents (granted/in process) covering areas in sensors, display technology, opto-electronics, and semiconductor packaging materials and process. She volunteers and teaches packaging materials engineering courses and

green packaging courses by partnering with university professors. She also co-chairs sessions at technical conferences such as the InterPACK, a premier international forum for exchange of state-of-the-art knowledge in electronic packaging and optical packaging.

Dr. Prakash is equally committed to growing the next generation of STEM innovators. At Intel, she actively mentors junior engineers, female interns, recent college graduates, women in technical positions, and women reentering the workforce. Outside Intel, Dr. Prakash is the Jedi mentor for the Arizona Technology Council Foundation's Chief Science Officers program, working with executive staff and local schools to provide support and feedback for improving STEM education in Arizona. She teaches robotics, coding, problem-solving methods, and core values, such as teamwork, in local schools and communities, and has volunteered 300 to 400 hours each year over the last decade.

As an education activist, along with her daughter, she co-founded Education Empowers Inc., a non-profit organization to promote education for children, focusing on STEM, robotics, and sustainability. Local children meet weekly and learn skill sets that help them become next generation STEM leaders, giving them confidence to enter STEM careers. Her focus groups include girls, and underserved and underrepresented youth in STEM fields. Under her expert coaching, Dr. Prakash's teams have won several awards at *First®* LEGO League (FLL) regional and state championships. Her team has been featured on local news channels (Fox10 News) and she was honored with the Coach/Mentor Award at the 2016 Arizona State FLL championships.

Dr. Prakash holds B.S. and M.S. degrees from Madras University, South India, and a Ph.D. in chemistry from Arizona State University. She lives in Chandler, Arizona, with her husband, who is also an Intel engineer, and their two children.




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**SPARK AWARD**

## Marie S. Cole

IBM CORPORATION

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For demonstrating with limitless energy the lasting value of mentors in the lives and careers of women engineers; and for global influence on women in the electronics industry.

Marie Cole is a Distinguished Engineer in IBM Systems supply chain engineering. She is responsible for supplier technical management strategies to evaluate the quality and reliability of new technologies before they are introduced into IBM server and storage systems.

Cole is an internationally recognized expert in electronic packaging materials and has led development teams responsible for microelectronic packaging, card assembly, and subsystems with a focus on environmentally friendly materials and processes. She holds several U.S. patents, is a member of the IBM Academy of Technology, and has received several of the company's technical awards, including a Corporate Award for lead-free soldering transformation and a Best of IBM Award.

Several of Cole's conference publications have received Best Paper recognition by the Surface Mount Technology Association (SMTA). She has also received industry technical awards, including the 2014 SMTA Founder's Award and the 2014 ASM Engineering Materials Achievement Award. Cole currently represents IBM on the International Electronics Manufacturing Initiative (iNEMI) board of directors, and served previously on the SMTA board of directors, and was the first woman to serve on the High Density Packaging User Group's board of directors.

Cole's consistent support of her IBM colleagues is demonstrated by her involvement with organizations such as the Poughkeepsie Site Technical Vitality Council, the Systems Supply Chain Technical Expert

Council, and the Electronic Packaging Integration Technical Community. She is particularly dedicated to mentoring the pipeline of technical women at IBM, and has held leadership positions in various women's networking and career-development organizations. She has coached numerous women informally and through structured programs, such as the Technical Women's Pipeline program. Cole was instrumental in creating a gender styles communication program that was standard training for all managers in IBM Microelectronics. Her outreach within the IBM Microelectronics and Systems divisions has positively impacted women in a global population of more than 10,000 employees.

Described by one of her mentees as "an inspirational leader with great innovative insights and influence," Cole's enthusiastic support and wise counsel are taken and treasured by her many colleagues and friends, and countless women and girls. Cole is also an IEEE senior member, and a member of the International Microelectronics Assembly and Packaging Society and the Project Management Institute. She is active in the Society of Women Engineers' Mid-Hudson Section and is a SWE life member.

Cole joined IBM in 1984 after completing a B.S. in chemical engineering from Rensselaer Polytechnic Institute, and later, after joining IBM, earned an M.S. in materials science from Columbia University.

She and her husband are active in several Hudson Valley music and musical theater organizations.

## SPARK AWARD

## Mary Driver

LOCKHEED MARTIN CORPORATION



For singular dedication to promoting diversity in engineering through mentorship; for exemplary service and commitment to SWE; and for proving that women helping other women leads to success for all.

Mary Driver is a systems engineering manager for Lockheed Martin Rotary and Mission Systems in Owego, New York, where she leads its systems and cybersecurity engineering teams. She is also site lead for the engineering core competency center, responsible for defining the training strategy for the engineering workforce on model-based practices, tool, process, and program implementation.

Previously, Driver was responsible for the site management of engineering services, such as configuration/data management and engineering tools. Through her passion for technical leadership and program execution, she has built a solid record of achievement, including the engineering project management of a large legacy defense program, modernization of its software, and coordination of its engineering disciplines, including leading a team in the implementation of Agile management processes. Driver is currently responsible for the team performing embedded cybersecurity engineering, and is working to address the growing critical skills needed for defense embedded systems. She also serves as the model-based engineering lead of the business' digital transformation.

Parallel with her technical achievements is Driver's passionate advocacy of young girls in STEM and for women in engineering. Driver is a STEM program lead for Lockheed Martin Owego Girls in Engineering, where she coordinates many company-sponsored community outreach events for elementary, middle school, and high school girls, including on-site tours and hands-on engineering projects.

Driver has also been a member of the SWE Greater Binghamton Section since 2011, focusing on profes-

sional development, mentoring undergraduate SWE members, engaging in STEM outreach, running fundraisers, and creating a collegiate scholarship fund. From 2011 to 2012, she was outreach committee chair, putting together a project proposal with area Girl Scouts, which received a SWE grant. As co-president from 2012 to 2013, Driver coordinated networking and mentoring events, and membership drives, as well as mentoring Binghamton University SWE members on resume writing, interviewing, and business etiquette skills. Though she stepped away in 2013 to raise a young family, Driver continued supporting SWE conferences as a recruiter and member, and consistently promoted SWE's benefits to her co-workers.

She returned to her local SWE section in 2016, to find that it had all but disbanded, and since November 2016, Driver has taken steps to make the section active again, this time as its president.

Her outreach to young girls continues to disrupt the embedded assumption that "girls can't do math and science." Driver earned her B.A. in mathematics from the State University of New York at Albany, and an M.S. in electrical engineering from Binghamton University.

Outside of work, Driver spends the little free time afforded her by her three children running (in the last three years, she's run seven half marathons). She's also an avid home interior designer and always has a project in the works at her home. As a Binghamton University alumna, Driver contributes when she can to events at the school and loves to attend a good soccer match!



## SPARK AWARD

# Beverly Louie, Ph.D.

UNIVERSITY OF COLORADO BOULDER

For significant contributions toward inclusion and pay equity for women in engineering; and for opening the eyes of countless others to the power of diversity.

Beverly Louie, Ph.D., is director for teaching and learning initiatives in the Broadening Opportunity through Leadership and Diversity (BOLD) Center at the University of Colorado Boulder's College of Engineering and Applied Science. Her current research focuses on engineering student retention and performance, women's success in engineering, diversity, and collaborative learning.

Previously a research chemical engineer at the National Institute of Standards and Technology, Dr. Louie was tasked with analyzing pay data for the engineering staff. During her research, she discovered that women with similar seniority and experiences were paid less than their male peers. Based on her research and recommendations, the division chief rectified the pay differences, and ensured that pay raises reflected true merit. Dr. Louie was also instrumental in encouraging employers to provide on-site child care, her efforts resulting in the first such child care center at a federal laboratory outside the Washington, D.C., area.

Dr. Louie has worked tirelessly to expand scholarships and research opportunities for women engineers. As director for the CU-Boulder Women in Engineering Program (WIEP), Dr. Louie grew the scholarship program from an annual, 20 two-year awards to more than 120 four-year awards for female engineering students. She established the first-ever corporate board scholarship award through the help of the WIEP corporate advisory board, converting what had been an annual gift from companies to a permanent endowment.

She also co-founded and co-directed Your Own Undergraduate Research Experience at CU (YOU'RE@CU), with the goals of providing a short research experience, and a strong graduate mentor for interested candidates. The program boasts 60 percent women engineering students in its undergraduate population.

She has been a valued faculty advisor for the CU-Boulder sections of SWE and the Society of Asian Scientists and Engineers. In 1976, Dr. Louie revived SWE CU, which had been dormant since the 1960s, paving the way for hundreds of young women to experience SWE over the next 40 years. In her position in the BOLD Center, she guides the SWE section in decision-making and finances. In 2016, SWE CU received the Region *i* award for membership growth.

Dr. Louie holds B.S. and M.S. degrees in chemical engineering from CU, and a D.Phil. in mechanical engineering from the University of Oxford, England. She has taught a variety of first-year engineering and chemical engineering laboratory courses as an instructor at the College.

In addition to her academic commitments, Dr. Louie served on the board of directors for the Women in Engineering ProActive Network. She has volunteered for a disabled ski program at Winter Park, and she was on the board of directors of YWCA Boulder County. Along with bicycle touring with her husband, she and her family of two sons and a daughter-in-law enjoy hiking with their numerous canine companions.



## SPARK AWARD

## Lynn Mortensen

RAYTHEON COMPANY (RETIRED)  
STEM Advocate



For exceptional advocacy of women in engineering that not only informs the heart of her successful career, but continues to grow steadily stronger in retirement through SWE and through service to the community.

Lynn Mortensen is following her passion as a STEM advocate and volunteer after spending 30-plus years in the aerospace and defense industry.

She began her career as a computer scientist with a B.S. in computer science from California State Polytechnic University, Pomona. In 2013, she retired as vice president, engineering, intelligence, and information systems at the Raytheon Company. In between, she held many positions within the company, advancing from program management to product development and engineering management, culminating in the leadership of a \$3 billion business segment.

As she climbed the ladder, Mortensen brought other women with her through extensive and consistent mentoring, open-door availability, and honest feedback that impacted the lives and careers of many women in Raytheon's 70,000-employee workforce.

During her career, Mortensen received several awards, including the Malcolm R. Currie Innovation Award and Raytheon Women's Network Woman to Watch Award. In 2011, she received Women Worth Watching in Technology recognition from *Diversity Journal*. As a Raytheon executive, Mortensen supported several SWE conferences as keynote speaker at the Raytheon- and Navy-sponsored collegiate luncheons, as well as many sessions on mentoring.

She is active in her community, promoting STEM education through participation as a member of the Tech Titans STEM Talent/Workforce Team, The University of Texas at Dallas Jonsson School Industrial

Advisory Council and leader of the STEM Team, and The University of Texas at Arlington College of Engineering board of advisors. She is also active with the Collin College department of engineering as a mentor to students, partner in outreach activities, and a member of its Convergence Technologies Business and Industry Leadership Team.

Mortensen has been an active SWE member since 2008. As a member of the Dallas Section's outreach committee, she has taken on leadership roles for its signature Design Your World – STEM Conference for Girls, and as the lead for the scholarship committee. Mortensen is also an active volunteer at BEST robotics events, and for the High Tech High Heels Speakers Bureau, as both a speaker and a member of its grant-review team. She is quick to mentor professional and collegiate members, either individually or through focused events.

As a member of the STEM advisory board for the Girl Scouts of Northeast Texas, Mortensen helps identify technologies and activities for the Girl Scout STEM Center of Excellence at Camp Whispering Cedars in Dallas. She continues to share her wealth of knowledge with the next generation, with the goal of increasing the number and diversity of engineers.

Mortensen enjoys traveling throughout the United States and cruising to international locations. When in Texas, the Mortensen family often enjoys time together at Cedar Creek Lake.




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**SPARK AWARD**

## Heather Savage-Erickson

MEDTRONIC

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For outstanding leadership and STEM advocacy, establishing a culture of mentoring at work and in the community; and for embodying the positive influences of mentorship.

A co-op program at a start-up medical device company inspired Heather Savage-Erickson to pursue a career in medical device product development, and to carry that early inspiration to others throughout her career. Currently, she is a supply management director in Medtronic's Restorative Therapies Group.

After the development, launch, and patent at her first job as a project engineer, Savage-Erickson returned to school to obtain her M.S. in engineering and MBA degrees from California Polytechnic State University, San Luis Obispo, where she had earned her B.S. in mechanical engineering. Since then, she has spent her career developing, manufacturing, and marketing medical devices.

Savage-Erickson holds four patents, a lean Six Sigma green belt, and multiple internal recognitions. In addition, she serves as an advisor to SWEnet, an employee resource group at Medtronic focused on outreach, professional development, and networking for women engineers.

Savage-Erickson's drive to inspire and mentor generations of engineers spurs her active involvement in the community and in STEM outreach. In 2013, with an interest in expanding and deepening interactions between engineers and students, Savage-Erickson co-founded, and now co-directs, a Memphis-based, middle-school robotics competition, which provides a "gateway to STEM" competition for any student willing to take on the challenge. In the inaugural year, 30 students participated, mentored by three Medtronic

employees. By 2017, the competition had expanded to reach about 200 students annually, drawing more than 40 mentors from six companies.

She is also a consortium member for the Center for STEM Education for Girls; a Greater Memphis Medical Device Council (GMMDC) board member, serving on the subcommittee for outreach; and was a member of the implementation board for the Maxine Smith STEAM Academy, the first optional-only middle school in Memphis, Tennessee. She spearheaded development of the "Knights Knoll Tinker Karts" at the school, a tinkering space designed to enable creative young minds.

Savage-Erickson continues to mentor women engineers at Medtronic, where she had a pivotal role in doubling the company's hiring of women in technical positions in less than 10 years. Among her mentees, 27 have gone on to serve in board leadership positions. Her efforts have been recognized with Medtronic's Circle of Excellence Award and the NEXUS Mentoring Award, among others.

In the Memphis community, Savage-Erickson participates in 15 to 20 outreach events per year at schools. With the support of her loving and outreach-supporting husband, she makes a point of training and racing in an annual half-marathon, while raising two boys who swim competitively, and play baseball, basketball, and soccer.

She also travels as frequently as possible with her family as vacation time permits.

## EMERGING LEADER

## Nikki Bishop

SIEMENS



For self-possessed and fearless leadership resulting in substantial and long-lasting improvements, from the development of a library of software standards to devising innovative industrial automation solutions.

Nikki Bishop, P.E., has transformed every workplace throughout her career by expanding the boundaries of her job descriptions to make meaningful and long-lasting changes. After earning her bachelor's degree in chemical engineering from the Georgia Institute of Technology, Bishop started her career as an automation project engineer at Emerson, where she developed a library of software standards.

Those standards led to countless hours of engineering time saved as well as safer, more efficient plants throughout the process industry. She rose up the ranks while developing other innovative processes, including leading the development of pre-engineered packaged controlled solutions for complex process equipment such as boilers, heaters, and distillation columns.

As global turnaround program director, Bishop created automation solutions for arguably the most complex events in the process industry — outages, shutdowns, and turnarounds. She was awarded a sponsorship for the Emerson Executive MBA program, earning her MBA from The University of Texas at Austin in 2015.

In her first job, Bishop was the youngest on staff, and the only female engineer on the automation project engineering team. When she noticed manual data entry and configuration being done at her project assignment — modernizing the Westinghouse Savannah River Defense Waste processing facility control system — she learned visual basic programming and complex database navigation. With her newfound skills, Bishop

designed a tool that automatically converted old control system code to a modern version. Bishop's innovation not only reduced engineering hours spent on the project, but also reduced human-error risks for a project that dealt with controlling a nuclear-waste process for uranium and plutonium.

Her automatic database conversion tool resulted in another success story. She leveraged the tool to achieve a shorter testing time and a two-week reduction in the project schedule for a pharmaceutical product in her role as lead project engineer for the Eli Lilly and Company's New Bulk Humalog Facility project.

Bishop's leadership also enabled Baxter International to go to market with a new drug on the company's original timetable by meeting the U.S. Food and Drug Administration's required validation of batch code.

After the Baxter project was completed, Bishop led the technical configuration, testing, and commissioning of boiler projects for several major entities, including U.S. Steel, The Pennsylvania State University, and Oak Ridge National Laboratory. Bishop created a tool to automatically configure a standard set of boiler control modules, dubbed "boiler in a box," to drive efficiencies and reduce human error, energy costs, and emissions — resulting in safer, more efficient plants.

The Orlando, Florida, resident now serves as head of global field service and digital operations for Siemens; as mom to her two young sons; STEM and diversity and inclusion advocate at Siemens; and mentor to young women and men in her community.




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## EMERGING LEADER

# Erin M. Carroll

INTEL CORPORATION

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For demonstrating well-rounded leadership, from focusing her team to make digital and surveillance breakthroughs to energizing the technical women's community locally and overseas, through her company and SWE.

From her earliest days at Intel, Erin Carroll has taken on key technical leadership roles, driving pre- and post-silicon validation of critical hardware features, including a new security hardware technology for Intel's leading-edge processors. Pre-silicon validation in particular is critical because it functionally verifies the design through simulation before Intel spends millions of dollars to manufacture the actual silicon.

After Carroll realized the challenges of debugging silicon on first samples, she championed an effort to better validate silicon debug features prior to the design's being completed. That solution became the only debug feature that worked when her project's silicon arrived. She also served as the post-silicon validation technical lead for Intel's next-generation phone and tablet system on a chip product.

Carroll recognized the need for a technical women's community and garnered support from leaders within her organization to start a pilot program at Intel Oregon. She built a leadership team to help her run the community. Following the pilot's success, Carroll expanded the community to all seven of her team's Intel locations (including two internationally), identifying local leaders and helping them launch. She coached other Intel organizations to kick off their own groups.

In late 2015, Intel leaders recruited Carroll for the company's new Venture program, a 24-month engineering leadership development program, which lets small, multidisciplinary engineering teams work on high-profile engineering problems that Intel's president and CEO chooses. Carroll was chosen as the lead for a 2016 Venture team focusing on computer vision in the digital security and surveillance space.

Recently, Carroll transitioned into a brand-new role, serving as the technical assistant for the new Intel corporate vice president and general manager of the Communication & Devices Group.

Carroll has shown similarly impressive leadership skills in SWE, holding many key roles within the Columbia River Section, including two years as section president. At the region level, she reinvigorated the mentoring program, and served one year as lieutenant governor, working closely with the collegiate leadership team, the SWE Future Leaders, and assisting the region governor with region activities.

She also has made innovative improvements serving as the only woman, only technologist, and the youngest member on the Washington County (Oregon) Fair board. Since being elected president of the board in 2013, Carroll engaged six Intel volunteers to develop an Android and iPhone app for the fair. As vice president of the nonprofit arm of the fair board, the Washington County Fair educational fund board, she has encouraged new leadership and helped drive new fundraising ideas.

Carroll earned her B.S. in computer engineering from the University of Michigan, where she served as an officer in the SWE collegiate section, and a master's in engineering and technology management from Portland State University, where she was in the top 10 percent of her graduating class and a member of OMEGA RHO International Honor Society for Operations Research and Management Science.

In her free time, Carroll enjoys exploring Portland and the Pacific Northwest with her husband, John; hosting monthly board game nights with her friends; and training multiple times a week at Orangetheory Fitness.

## EMERGING LEADER

## Jill A. Entner

TORRANCE REFINING COMPANY, LLC, A SUBSIDIARY OF PBF ENERGY INC.



For embracing a varied career path by learning quickly; for identifying improvement opportunities that bring tangible results; and for leading organizational change and creating a long-term vision.

Jill Entner, capital projects manager for Torrance Refining Company, LLC, has embraced a diverse career, mixing more traditional roles with a number of special assignments that have developed her leadership skills in technical, safety, and change management.

Upon graduating *cum laude* from the University of Michigan with a B.S. in industrial and operations engineering in 2002, Entner joined Exxon Mobil Corporation in Virginia, where she was a supply logistics coordinator and distribution analyst. In the analyst role, she was selected to be the U.S. representative on a global integrated business team, facilitating best practice sharing with her counterparts in Europe and Asia. For this effort, she was recognized with the ExxonMobil Global Industrial and Wholesale Recognition Award.

In 2006, Entner accepted an assignment at the ExxonMobil Torrance Refinery as a project engineer. While in this role, she began her journey in safety leadership as a charter member of a plantwide safety initiative. The following year, Entner moved to a newly formed infrastructure improvement initiative division as a program manager, driving improvements on the technical portion of the program while maintaining a strong focus on safety, earning her two safety recognition awards.

Promoted to the position of turnaround event manager in 2008, Entner led the efforts to coordinate several successful multimillion-dollar maintenance shutdowns. In 2009, she was named process section supervisor of the refinery's sulfur recovery unit, managing a mix of first-line supervisors and wage personnel. During her leadership, Entner successfully executed

a major \$6.8 million maintenance effort and the successful start-up of a new \$14 million environmental compliance project on time, under budget, and with zero safety incidents.

In 2010, Entner began the first of several special assignments, which included leading a number of major changes in the organization. She coordinated the implementation of a large-scale upgrade to the maintenance, timekeeping, and accounting systems; developed and executed the implementation of a matrix organization structure; and served as the asset transition lead, managing a cross-functional team responsible for preparing the refinery for a change of ownership from ExxonMobil to PBF Energy. Among these assignments, Entner also served as the training section supervisor and the refinery controls advisor. Upon completion of the sale in 2016, Entner returned to her current role as capital projects manager, leading a team of 30 employees responsible for the development and execution of \$18 million in capital projects and the stewardship of more than \$200 million of capital spend annually.

Active in SWE since college, Entner served as Baltimore-Washington Section president as well as other leadership positions, and coordinated ExxonMobil's participation in the annual conference.

In addition to her participation in SWE, Entner is engaged in her community, advocating for women in a variety of areas. She is an active member of the Junior League of Orange County and received its Annual Spirit of the League Award in 2013. During her personal time, she enjoys spending time with her husband, Mark, and her two young sons.




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## EMERGING LEADER

# Kelly D. Hahn, Ph.D.

SANDIA NATIONAL LABORATORIES

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For exemplary leadership, including collaboration with a multidisciplinary group of engineers and scientists; for developing innovative diagnostic capabilities; and for extracting critical new information.

**K**elly Hahn, Ph.D., a scientist in the neutron diagnostics group at Sandia National Laboratories, is responsible for neutron diagnostic fielding and development on the Z pulsed power facility. Z is one of three major facilities in the United States pursuing physics studies of inertial confinement fusion (ICF).

Since joining the diagnostics team in 2010, Dr. Hahn has become the subject matter expert responsible for measuring neutron yield by fielding activation samples. These measurements are among the most important metrics in diagnosing the ICF experiments.

Building upon her educational achievements, as one of the 60 scientists at Z Dr. Hahn has the greatest responsibility for determining neutron yield and measuring its uncertainty on approximately 50 ICF shots per year on Z.

The number of neutrons produced in each experiment is a key metric of target performance. Dr. Hahn is responsible for configuration and analysis of indium and copper activation samples used to infer neutron yield at Z. This includes maintaining, calibrating, and operating nuclear instruments such as high-purity germanium detectors and a sodium-iodide gamma coincidence counting system. It also includes developing neutron transport models using the Monte Carlo N-Particle (MCNP) code to correct for scatter and attenuation in the Z load hardware surrounding the activation samples.

Dr. Hahn earned her bachelor's, master's, and Ph.D. degrees in electrical engineering from The University of New Mexico. Her master's thesis compared different cathode topologies on the performance of a high-power, backward-wave oscillator. As part of her research, Dr.

Hahn routinely suited up in a lab coat and crawled into the oil-filled Marx tank (with the oil pumped out) to perform maintenance and repairs.

Her responsibilities also include collaborating with other laboratories (Lawrence Livermore National Laboratories, Los Alamos National Laboratories) and universities [Massachusetts Institute of Technology (MIT), University of Rochester's Laboratory for Laser Energetics, and University of New Mexico (UNM)]. She has documented the Z neutron diagnostic capabilities in peer-reviewed journals and co-authored more than 35 articles in peer-reviewed journals.

Dr. Hahn quickly earned a position of trust in the Z ICF community as the person most looked to for accurate neutron yield measurements with appropriately considered uncertainties.

In addition, Dr. Hahn led the first-ever experimental campaigns on the radiographic integrated test stand to measure the temporal variations of the X-ray spot size for the gas-filled paraxial diode. She also led several experimental campaigns to investigate the self-magnetic pinch diode, one of the United States' leading candidates for intense electron-beam driven X-ray radiography.

In addition to her intellectual leadership, Dr. Hahn mentors undergraduate and graduate students in Sandia's summer research program, as well as students from other universities such as MIT, Pomona College, the Missouri University of Science and Technology, and UNM. She involves the students in technical areas outside their disciplines to expose them to different aspects of the research and development environment.

## EMERGING LEADER

## Christine M. Predaina

NORTHROP GRUMMAN CORPORATION



For exhibiting true leadership capabilities while developing the next generation of engineering trailblazers; and for advancing an innovative approach to systems engineering collaboration.

Christine M. Predaina has a long legacy of engineering leadership — from her SWE student section, through years of technical leadership and program management, to her present position as an executive at Northrop Grumman Corporation. She is known for her leadership in program management and systems engineering, and as a champion for diversity and inclusion. She currently serves as director of program management operations for Northrop Grumman's Technology Services sector, overseeing effective program performance across a diverse multibillion-dollar global portfolio.

Predaina demonstrates a natural penchant for technical excellence and leadership at Northrop Grumman, first exemplified by her promotion to program manager of a successful multimillion-dollar program portfolio at age 25. Her diverse career as a systems engineer, engineering manager, and program manager includes broad technical experience. She has led teams through complex engineering problems in: hardware design and manufacturing, software development, technology research, systems integration, engineering process improvement, mission assurance, and multinational programs of importance to global security. Her reputation as a technical problem-solver at Northrop Grumman has been recognized with numerous awards and invitations to multiple highly selective professional development programs, furthering her maturation as an engineer and female technical leader.

The foundation for Predaina's breadth of engineering leadership roles started at the University of Colorado, where she led multiple student organizations while earning two degrees: a B.S. in computer science and a B.A. in astrophysical and planetary sciences. Furthering her education, she attained an M.S. in engineering management from The George Washington University

and a graduate certificate in project management and leadership from UCLA. She is also a certified PMI project management professional (PMP) and INCOSE certified systems engineering professional (CSEP).

Predaina is deeply committed to making a difference in her workplace, volunteering to lead several employee resource groups and engineering strategic initiatives across Northrop Grumman throughout her career. She connects thousands of employees to professional development opportunities, technical presentations, job rotations, and social and philanthropic activities. For years, she has enabled the sponsorship of hundreds of SWE memberships at Northrop Grumman, encouraging her fellow employees to engage at all levels of the Society, across SWE sections in 29 states and three countries. A SWE life member, Predaina serves her company as the executive sponsor for the global Northrop Grumman Women's International Network.

Outside of work, community service is of immense importance to Predaina. She is an inspiring speaker who encourages the engineering leadership aspirations of students and professionals through keynotes, panels, and workshops with audiences across the country, including a feature role in DiscoverE's Girl Day national social media campaign during DiscoverE: Engineers Week. She is an advocate for science, technology, engineering, and math education, annually engaging congressional support for the National Space Grant College and serving on the Colorado Space Grant Consortium advisory board. Committed to developing future technical leaders, Predaina is also a dedicated mentor to numerous engineering students and developing engineering professionals. She is an avid traveler and loves being outdoors hiking, skiing, cycling, or otherwise exploring the world.